of intelligence separated those whose fathers had a salary under $1,000, from those whose fathers had salaries above this level. Above this level, however, there was but little rise in average marks with increasing rise of economic position.

Of the other differences that may be supposed to be hereditary, the most interesting are the differences of sex. Throughout, the boys show a marked and persistent superiority in the tests of intelligence. The girls, on the other hand, are consistently rated higher in their school work. Owing, however, to the circumstances that the high school students form a somewhat selected group, and that there are a larger number of girls among them than of boys, inferences from these apparent sex-differences can be drawn only with considerable caution.

One interesting fact which the survey discloses is the following. The occupations chosen by the various students are often wholly out of all agreement with the pupils' own innate ability. The dullest seniors, both boys and girls, are selecting such occupations as teaching and medicine, which clearly demand the exercise of a mental equipment far beyond their native powers. On the other hand, the brightest girls in the entire State are content to choose mere clerical employments, and some of the brighter boys choose farming, occupations, in both cases, well below the intellectual level of those who are selecting them. Generally speaking, the curriculum of the high school is directing its pupils to a range of occupations which is excessively narrow as compared with that of the social classes from which the pupils are drawn. As Professor Book points out: "All the students seem to need more efficient educational and vocational guidance than our high schools are at present able to give them."

CYRIL BURT.

**Burt, Cyril, D.Sc.** *Mental and Scholastic Tests.* Report by the Education Officer submitting Three Memoranda by the Psychologist. London County Council. King and Son. 1921. pp. xv. × 432. 21s. net.

THE extravagance of the claims hitherto advanced and the inadequacy and lack of uniformity in the methods of application have been largely responsible for the adverse criticism and even ridicule which have been for so long directed upon the Binet-Simon scale and similar tests for measuring intelligence or detecting mental deficiency. A book therefore by Dr. Burt, the outstanding authority in this country in all problems relating to mental tests, which sets forth the detailed results of his investigations into their standardisation and diagnostic value and which gives us incontovertible evidence based upon precise data and mathematical analysis, is of the highest importance and value. It is not too much to say that where before we had no English adaptation of the Binet-Simon scale, no standardisation, and no trustworthy series of age norms, where before we were in a state of chaotic confusion, we have now not only had given to us a scale, which for practical use far surpasses any that has been put forward elsewhere, but also we have the methods and results of the scale so standardised that uniformity and reliability are easy of attainment.

The book consists of three memoranda—the first presents an exposi-

tion of the Binet-Simon tests in a form adapted for use with English children; the second discusses the theoretical validity of the results obtained; and the third gives a detailed and systematic set of scholastic tests for estimating educational attainments.

In the first memorandum the changes in the actual procedure necessitated by translating the French instructions and adjusting them for use in England are fully set out with detailed practical instructions as to *technique* for each test. Although Dr. Burt has kept as far as possible to the exact procedure of Binet and Simon for purposes of comparability and uniformity, he is far from being satisfied with the scale as a whole, and regards it only as a tentative one. He is of opinion that for exact and scientific purposes an entirely new scale must eventually be constructed and that modifications of the present scale must then be wholesale and drastic, but that meanwhile departures from the original scale must be reduced to a minimum, for "if the Binet-Simon scale is to be retained at all then uniformity can be secured and confusion avoided only be returning for the time being to the exact procedure of Binet and Simon themselves." There is found to be no real advantage in the American and Italian versions of the scale: of all the revisions the Stanford Revision is considered to be the most effective and the most radical, though the children upon whose performances it is based appear to have been of a higher intellectual level than the average child in the London elementary school. An examination of the Yerkes' Point Scale shows that it loses much of its character as an intructions test and that the weighting of the various tests is not determined by their diagnostic significance.

The second memorandum deals with the reliability and accuracy of the tests as a measure of intelligence and finally with the central problem, the diagnosis of mental deficiency. The results are based on an examination of 3,500 children, of whom 729 were defectives and 107 were juvenile delinquents. By comparing the considered estimates of observant teachers with the results of the Binet-Simon tests and defining intelligence as "inborn all round mental ability" it is found that with children in ordinary elementary schools the Binet-Simon tests, as tests of intelligence, prove but moderately successful; in discriminating the child of the special school from the child of the ordinary school, and in grading the special school children amongst themselves the scale is tolerably efficient.

Mental deficiency is treated from the administrative rather than the psychological standpoint, as Dr. Burt finds that for immediate practical purposes the only satisfactory definition is a percentage definition based on the amount of existing accommodation. In London Special schools there is accommodation for 1 per cent., so that "the mentally defective child is to be defined as one who for intelligence ranks among the lowest 1½ per cent. of the school population of the same age," and the line of demarcation between normals and defectives is fixed at a "mental ratio" (a term used by Dr. Burt to denote the ratio the mental age bears to the chronological age in preference to Stern's "intelligence quotient.") of 70%. According to Dr. Burt to justify a diagnosis of mental deficiency a child must be backward by at least 3/10 of his age—this is a much lower limit than

that allowed by Binet, who considered that a retardation of 2 years under the age of nine and of 3 years over nine was indicative of mental deficiency, and it is also much lower than any of the American standards. Though Dr. Burt's borderline is undoubtedly on the low side it is in accord with Karl Pearson's suggested estimate of something between 1 and 2 per cent. for the number of defectives among school children. An administrative definition however can hardly be considered as satisfactory when the accommodation for defective children in special schools for the whole country is only about .3 per cent. of the school population.

For adults Dr. Burt considers that a still lower and more lenient borderline is permissible. Provisionally he fixes the line of demarcation at a mental age of 8 according to his age assignment, which is equivalent to 8½ or 9 according to the earlier allocations. If this limit is confined to cases for whom segregation in institutions is necessary and does not include "supervision" cases, then his findings would appear to be eminently sound, though he recognises that as accommodation increases and as public opinion advances the limit will doubtless rise. This limit is in marked contrast to that suggested by the American Association for the Study of the Feebleminded, which, following Goddard, placed the upper limit of mental deficiency between the ages of 12 & 13; it is more in accord with that suggested by Dr. Simon, who has provisionally fixed the mental age of 9 as "the upper limit of mental debility."

In the third memorandum Mr. Burt gives us a systematic set of scholastic tests of his own with the norms for English school children and the results of their application to over 5,000 normal and 1,500 defective children. He finds these to be of positive service for measuring the extreme degrees of backwardness and advancement, and of still greater service in analysing the psychological causes of backwardness.

It would be impossible within the narrow limits of this review to give an adequate account of the conclusions arrived at or to do justice to this book by any form of criticism. Above all one is impressed by Dr. Burt's characteristic modesty and his determination to secure scientific exactitude. There is no question but that by this work Dr. Burt has transformed the mental test "from a discredited dodge of the charlatan into a recognised instrument of scientific precision."

E. PRIDEAUX.

**Ellis, Havelock.** *The Dance of Life.* pp. 340. Constable. Price

Readers of the *Eugenics Review* do not need to be reminded that Mr. Havelock Ellis is one of the first writers of our day. He is a most stimulating thinker, candid and fearless ; a humanist of wide and deep culture ; and a master of English style. This is in some ways the most interesting of his books, because it embodies his philosophy of life, the fruit of an old man's mature wisdom. It was begun, he tells us, fifteen years ago ; but very modern writers have influenced him ; for example, he acknowledges obligations to Mr. Carr Saunders' work on Population.

Mr. Ellis' philosophy is not unlike that of an equally brilliant